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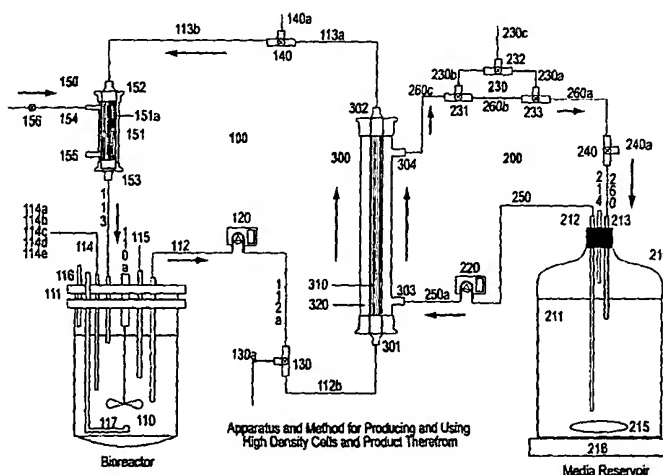
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(54) Title: APPARATUS AND METHODS FOR PRODUCING AND USING HIGH-DENSITY CELLS AND PRODUCTS THEREFROM



(57) Abstract: Disclosed and claimed is apparatus and methods for the growth of cells to high density, products therefrom and uses thereof. Also disclosed and claimed is the use of this method for the growth to high-density insect cells, such as the *Spodoptera frugiperda* Sf900+ cells at high cell density with wild type and recombinant baculoviruses to produce baculovirus and DNA or gene or expression products. The apparatus comprises three interconnected modules, the cell culturing loop (100), the media replenishment loop (200) and the hollow fiber dialysis device (300). Cells from the bioreactor (110) are transported through the lumen space (310) of hollow fiber dialysis and media from the media replenishment loop (200) is pumped through the extra-lumen space (320). Prior to re-entering the bioreactor the cells with media have oxygen added via the oxygenator (151).

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